Status of
L3 Efficiency Study

Lepton+Track Group Meeting

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Introduction

ephysr : RawData and L3	
e8...tau0 : RawData and PROD	

One File

RawData → **w/L3** → **w/L3&PROD**

L3exe   ProductionExe

- L3tag
- TCLtag
- CALIBtag

Problem

➢Can't use "hideList" of DHInput because of large difference in CDFSOFT (L3: 4.3.x, PROD: 4.8.4).
➢L3exe should be identified by 3 tags. These tags may change in a very short term (Order of Run#).

Tried to reproduce L3 objects in run #150444.
  (Stream E: TAU_ELECTRON8_TRACK5_ISO; ~6k)

➢Found one strange event (#1180782) which should pass ELECTRON_CENTRAL_8 but doesn't have its bit.
➢In one event (#2813866), my L3 electron which should be triggered doesn't have 8 GeV/c track while original L3 electron does.

Module for Study

➤ Open CdfEmObjectView in both L3 and PROD.

➤ PROD base

✓ Find qualified electron with PROD info.

✓ Then corresponding L3 electron using (px,py,pz).

➤ L3 base

✓ Find triggered electron with L3 info.

✓ Then corresponding PROD electron using (px,py,pz).

➤ Hist Et,Pt… and differences between L3&PROD.

➤ Hist Efficiency : (L3&PROD)/(PROD).

Histogram

➢ L3, PROD :

　Et, Pt, DeltaZ, Chi2_strip, Lshr, Had/Em(TrigTower).

➢ L3-PROD

　△Et, △Pt, $[1/\sqrt{Et_{L3}} - 1/\sqrt{Et_{PROD}}]$,

　△Pt/$[Pt_{L3}{}^\wedge 2 + Pt_{PROD}{}^\wedge 2]$, △DeltaZ, △Chi2_strip
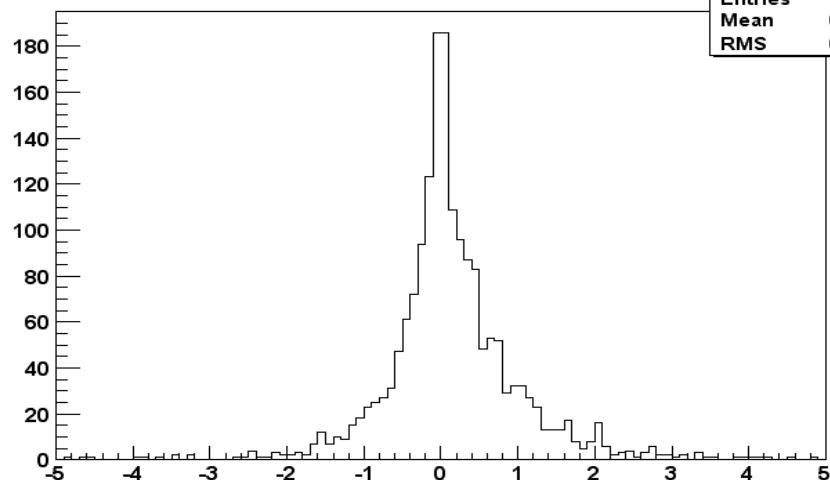
　△Had/Em(TrigTower)

➢ Error from calculation to find a set of L3 and PROD.

➢ L3 efficiency as a function of Et(PROD).

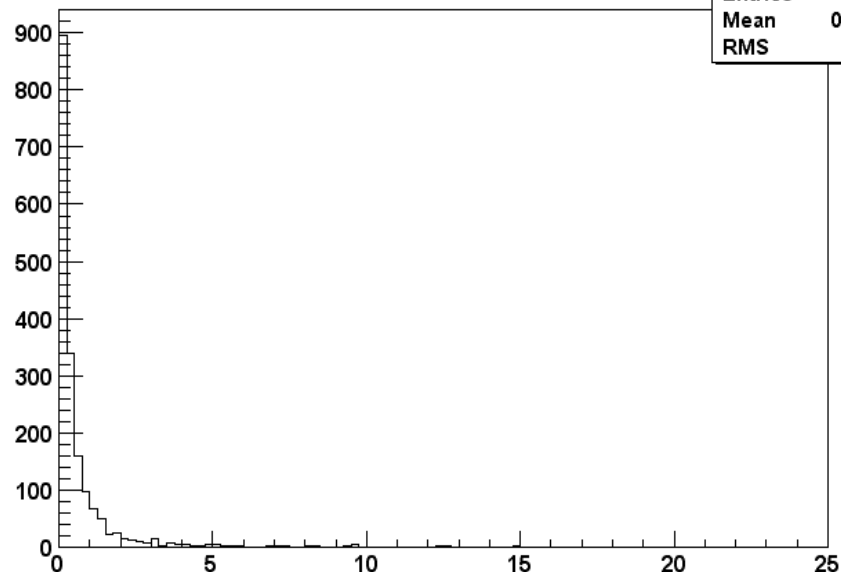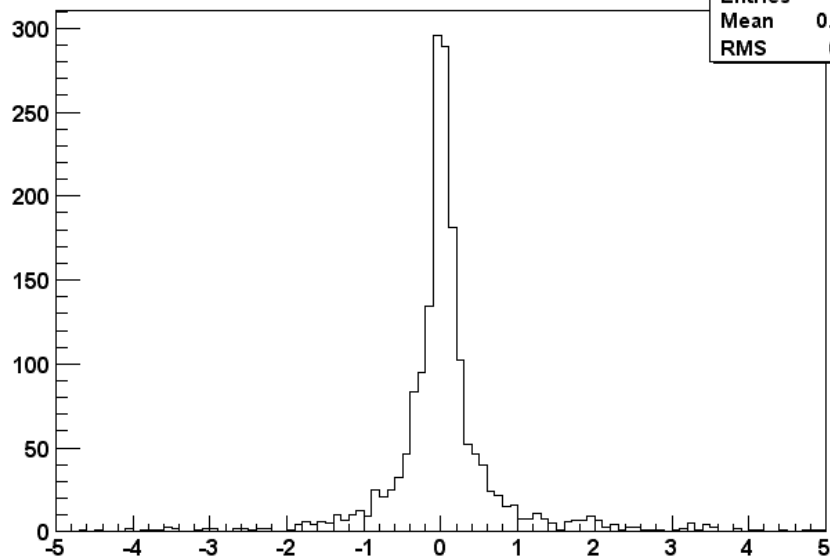# *Plot (I)*

E$_T$ (L3-PROD)

E$_T$ (L3-PROD)	
Entries	1802
Mean	0.1429
RMS	0.8778

Error (L3-PROD)

Error (L3-PROD)	
Entries	1802
Mean	0.7558
RMS	1.741

p$_T$ (L3-PROD)

p$_T$ (L3-PROD)	
Entries	1802
Mean	0.04006
RMS	0.8238

$$Err = \sqrt{\left(\vec{p}(L3) - \vec{p}(PROD)\right)^2}$$

Plot (II)
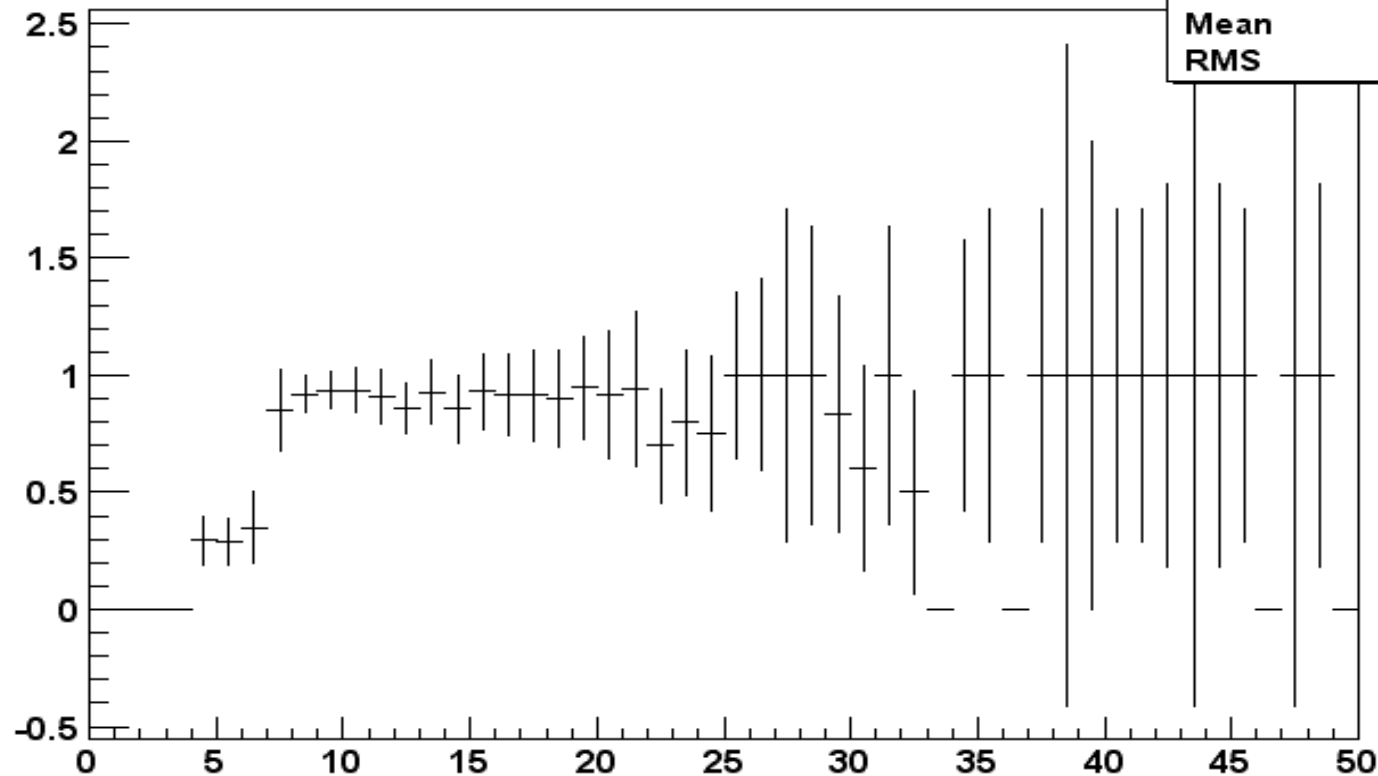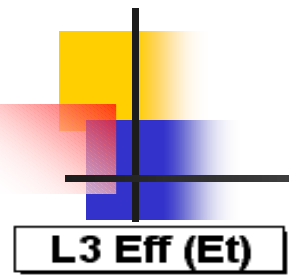
Note : this plot is made by biased sample.
Just for example.

Summary

➢ Ready to make a file for L3 efficiency study.
(Inconsistency of my and original L3 is ~1/6k)
➢ However we need expert's help for making L3exe.
➢ Writing code and debugging are almost done.
➢ Check List
   ✓ Choose useful histograms and other outputs.
   ✓ Define matching criteria for L3 and PROD.
   ✓ Check it with other data.
   ✓ ???

Plan

➢ Study with data after L1/L2 study. (Waiting…)
➢ Move to Iso.Track part.
➢ This work will help same study in muon case.